REMARKS

Claims 1-14 are pending.

A. The specification has been objected to and claims 1-14 have subsequently been rejected under 35 U.S.C. §112, first paragraph. The applicant respectfully traverses this rejection for the following reason(s).

The Examiner errs in holding the disclosure to be non-enabling disclosure based on the phrases "logical alarm" and "physical alarm" (a.k.a.: hardware alarm; analog alarm; real alarm). The Examiner has indicated that the Applicant has failed to clearly define the differences between the two terms. It should be noted that these terms are well known in the art of network communication.

Basic definitions include:

Real alarm: A real alarm is a transaction that represents a physical (hardware) alarm that later requires to be cleared;

Logical alarm: A logical alarm is any transaction event (with the exception of alarm acknowledges) that does not relate to a hardware state.

The Examiner points to the terms "Loss of Signal" and "Loss of Link" and indicates that either one could lead to the other. In network communications, however, it is well known that the detection of Loss of Signal is different from the detection of Loss of Link. For example, in the OSI (Open systems Interconnections) standard, divides telecommunications into seven layers. One layer

(Layer 1) is known as the "Physical Layer" and another layer (Layer 2) is known as the "Data Link Layer".

Each layer is monitored, and alarms created based on errors detected in the physical layer (layer 1) will result in the generation of a physical alarm. The features looked for are well known in the art, such as loss of signal (LOS), loss of frame (LOF) or loss of pointer (LOP).

Alarms created based on errors detected in the data link layer (layer 2) result in the generation of a logical alarm. The features looked for are also well known in the art, such as loss of link (LOS), or poor quality of signal (QOS).

I paragraph [0032] of the specification, it is difinitely disclosed so that a logical error related to a logical alarm and a physical error related to a physical alarm are discerned from each other, thus those of ordinary skill in the art can easily understand what a logical alarm and a physical is based on the original specification.

Therefore, since the phrases "physical alarm" and "logical alarm" and the differences there between are well known in the art, the rejection is deemed to be in error and should be withdrawn.

B. Claims 1-14 were rejected under 35 U.S.C. §112, second paragraph based upon a number of deficiencies kindly noted by the Examiner. Accordingly the above amendment is believed to correct for those deficiencies.

a) The Examiner errs is holding that the phrase "logical alarm", claim 1, lines 4 and 6, is not supported by the specification.

Amended paragraph **[0032]** discloses:

> Accordingly, the network management system 300 analyzes the alarm data format to determine at step 504 whether the nature of the alarm corresponds to a logical error or a physical error. If the alarm generated from a certain network element is determined to correspond to a physical error, like loss of signal (LOS), alarm indication signal (AIS), loss of frame (LOF), loss of pointer (LOP), etc., rather than a logical alarm like loss of link (LOL), poor quality of signal (QOS), etc., the network management system proceeds to step 506 to simply parse the data format of the received alarm information for storage into the database 302.

Accordingly, the specification, and in particular, paragraph **[0032]** uses both terms "logical error" and "logical alarm" and defines how these terms are related.

b) The Examiner errs is holding that the phrase "alarm information corresponding to a logical alarm" (*alarm information corresponds to a logical alarm*: claim 1, line 4) is not understood . The Examiner errs in stating that " 'logical' may refer to the type of errors that contribute to alarm information, but no to the alarm."

Clearly, if the error type is a logical error, and such errors generate an alarm, then the alarm can be deemed a *logical alarm*, especially when paragraph **[0032]** of the specification relates logical errors and logical alarms. Additionally, the Applicant can be his own lexicographer and as long as the terminology is defined by the specification, then there is no error in its use.

c) The Examiner indicates that the phrase "alarm information does not correspond to a logical alarm" (*alarm information corresponds to a logical alarm*: claim 1, line) is not understood, holding that it "is unclear what other type of alarm information can exist or how to differentiate between

them."

The purpose of the claim is to set forth the invention in a clear manor in light of the specification. Claims are not to be read in a vacuum. It is the purpose of the specification, not the claims, to define what other type of alarm information can exist and how to differentiate between them. The specification clearly defines the different types of alarms that can exist. It is well known in the art how to differentiate between different types of alarms.

Besides, claim 1 calls for *determining whether or not said alarm information corresponds to a logical alarm.* Therefore, it only matters whether the alarm information is a logical alarm. If it is not a logical alarm, in this instance, then it can be any type of other alarm. The claim, at this point, is only concerned with logical alarms.

d) The Examiner indicates that the phrases "logical error" and "physical error" of claim 8, lines 6 and 9, and claim 1, line 3, are not understood, and more specifically the Examiner fails to understand how an error ma be designated as logical or physical.

It has been shown that it is well known in the art what is meant by "logical error" and "physical error" ("logical alarm" and "physical alarm") and that it is well known by those of ordinary skill in the art how to differentiate between them.

Each of the issues raised by the Examiner have been shown to be easily understood by one of ordinary skill in the art and/or well defined by the specification. Accordingly, the rejection is deemed to be in error should be withdrawn.

C. Claims 1-14 were rejected under 35 U.S.C. §103(a) as being obvious in view of Harris (US 5,946,373) and Joyce (US 4,195,343). The applicant respectfully traverses this rejection for the following reason(s).

Claims 1 and 8

The present invention relates to a network management system for optimizing a database which stores alarm information generated from a plurality of network elements in order to manage those network elements.

In particular, when an alarm is received it is first determined whether the alarm is a logical alarm or based on physical information. Then the network element generating the alarm is determined and a database is maintained to record the occurrence if it is a logical alarm as opposed to physical information. Each time a particular network element generates an already recorded alarm occurrence, a counter is increased with the increased count being recorded instead of recording the alarm event again.

The specification defines a logical alarm as one of, for example, a loss of link (LOL) or a poor quality of signal (QOS), and defines physical information (error) as one of, for example, loss of signal (LOS), alarm indication signal (AIS), loss of frame (LOF), or loss of pointer (LOP).

Harris' invention also relates to a network management system for optimizing a database which stores alarm information generated from a plurality of network elements in order to manage those network elements.

There does not appear to be any disclosed determination of whether or not the alarm information corresponds to a logical alarm.

Note in col. 1, lines 61-65, Harris mentions "when a failure occurs on a circuit, the equipment closest to the failure detects the fault ("loss of signal", for example), reports the fault, and propagates an alarm indicator signal in the "downstream" direction on the affected circuit." Accordingly, at least one fault in Harris is defined as a 'loss of signal," which has been defined by the present invention as a physical error instead of a logical error.

In col. 4, lines 11-14, Harris discloses that only certain alarm messages are extracted and analyzed, *i.e.*, "This invention contains an interface, shown in FIG. 2A, to the message reception process to extract only certain selected fault alarm messages as indicated in step 201. That is, those fault alarms indicating a circuit or trunk traffic outage, plus the messages that indicate that such a fault condition has now "cleared".

Accordingly, Harris is only concerned with physical errors and thus, physical alarms.

That is, Harris only checks for a circuit or trunk outage. Harris does not look for the cause of the outage, such whether it was due to a loss of link (LOL) or a loss of signal (LOS).

Therefore, there is clearly no method of *determining whether or not said alarm information corresponds to a logical alarm* (claim 1). As mentioned above, Harris is only concerned with physical alarms, and thus has no desire to determine whether or not alarm information corresponds to a logical alarm. That is, Harris only teaches determining whether or not alarm information corresponds to a physical alarm.

Note that the terms "logical alarms" and "physical alarm" are not open to unreasonable

interpretation, that is, interpretations outside the bounds of the Applicant's disclosure and what is well known in the art. The difference between "physical alarms" and "logical alarms" are well established in the art. Harris's circuit and trunk traffic are physical (hardware) features of a network, and therefore correspond only to "physical errors" and related "physical alarms."

The Examiner does no apply Joyce as a teaching of the foregoing feature noted as lacking in Harris. Accordingly, the combination of Harris and Joyce fails to make obvious the feature of *determining whether or not said alarm information corresponds to a* ***logical*** *alarm.*

Additionally, those features that rely in the foregoing step of *determining*, are also not taught by the applied art. For example, claims 1 and 8 call for *determining the location of the network element generating the alarm information, when it is determined that the alarm information is due to a logical error*. since Harris does not make any determinations with respect to logical errors, then the foregoing feature of claims 1 and 8 are not taught by Harris. Joyce was not applied in this regard.

Accordingly, the rejection of claim 1 is deemed to be in error and should be withdrawn.

Claim 1 and claim 8 both call for *searching a database to determine whether said database already has said alarm information stored therein, according to the location of the network element generating the alarm information*.

Harris does not disclose this feature. The Examiner has referred us to Harris' col. 8, lines 5-15:

> "This circuit alarm count serves two purposes: first, if an explicit fault alarm is reported for that trunk, then the presence of alarms on the contained circuits provides a confirmation that the trunk fault is actually causing a traffic outage; and second, a fault on a trunk can be

inferred if a majority of the circuits on that trunk report alarms.

For efficiency in later processing, some additional processing (245) can be performed as the circuit alarm is counted on each of the upstream trunks. If the circuit alarm is the first alarm to be counted on a given trunk, or if the time-stamp of the alarm falls outside the window for presuming correlation with any previous alarms, then the time-stamp of that alarm and the set of all upstream trunks are stored in the data structure representing the trunk. Otherwise, if the circuit alarm is not the first one to be counted on a given trunk and the time-stamp of that alarm is within the window necessary for presuming correlation with the previous alarms, then the set of upstream trunks for the new alarm is intersected with that of the previous alarm or alarms (that is, all trunks common to both sets are extracted), and the new list is stored in the trunk data structure. This intersection set will be referred to as the "common path set" for the circuits on the trunk: at any given time, this is the set of trunks that contain all of the same circuits as those counted on the given trunk. (This set always contains the given trunk itself, and it may contain only that trunk if the circuits do not have any other trunks in common.) The significance of this common path set is that the circuit alarms counted on the given trunk could actually be caused by an outage on any of these trunks."

It is clear from the above that Harris is concerned with the "trunks" of the network, wherein such trunks consists of a series of transmission equipment connections through the network. Accordingly, the location of the network element, i.e., transmission equipment, causing the fault is not known and such location is not the basis for a database search.

Now, the Examiner has referred us to Harris' col. 11, lines 5-15:

The result of process 264 is a list of one of more trunks that could be the location of a fault causing the observed circuit alarms. This list is returned to the Evaluate Circuit Alarm Counts on Trunk process in FIG. 2E. There may be many trunks which are over their circuit-alarm thresholds, which may or may not be in this list, but all of which can be explained by a fault in this set of trunks. Each of these trunks will be evaluated separately, and in fact each of these trunks may be evaluated several times as new circuit alarms are received. Therefore, a separate data structure needs to be maintained to record this inferred fault location. Specifically, this data structure will record whether or not the inferred fault has already been reported, and it will allow detection of any change that requires that the report needs to be updated (such as any shortening or lengthening of the list of possible faulted trunks).

> Step 265 compares the existing set of such data structures against the list of trunks produced in step 264 to determine if there is any match or partial match. If no intersection is found with any previously asserted outage, a new data structure is initialized in step 266 to represent the newly recognized trunk outage. A counter is initialized to one, representing the total number of trunks either directly involved in or indirectly explained by the new outage.

This section of Harris is still concerned with the "trunks" of the network, wherein such trunks consists of a series of transmission equipment connections through the network. Accordingly, the location of the network element, i.e., transmission equipment, causing the fault is not known and such location is not the basis for a database search.

Therefore, the rejection of claims 1 and 8 is deemed to be in error and should be withdrawn. Joyce was not applied in this regard.

Both claim 1 and claim 8 call for *increasing a count value representing a number of times in which the same alarm information has been generated, without redundantly storing said alarm information into said database, when it is determined that said alarm information is already stored in said database.*

In Harris' count process, each upstream trunk is processed in turn. On each trunk, a circuit alarm counter is incremented. The directionality of the circuit alarm with respect to the trunk is significant and separate counters are maintained for circuit alarms in each direction.

If the circuit alarm is the first alarm to be counted on a given trunk, or if the time-stamp of the alarm falls outside the window for presuming correlation with any previous alarms, then the time-stamp of that alarm and the set of all upstream trunks are stored in the data structure

representing the trunk. Otherwise, if the circuit alarm is not the first one to be counted on a given trunk and the time-stamp of that alarm is within the window necessary for presuming correlation with the previous alarms, then the set of upstream trunks for the new alarm is intersected with that of the previous alarm or alarms (that is, all trunks common to both sets are extracted), and the new list is stored in the trunk data structure. This intersection set will be referred to as the "common path set" for the circuits on the trunk: at any given time, this is the set of trunks that contain all of the same circuits as those counted on the given trunk. (This set always contains the given trunk itself, and it may contain only that trunk if the circuits do not have any other trunks in common.) The significance of this common path set is that the circuit alarms counted on the given trunk could actually be caused by an outage **on any of these trunks.**

Every time that a circuit alarm counter is incremented on a given trunk, then that trunk is evaluated to determine if a fault can be **inferred** from the circuit alarms or if a reported trunk fault can be confirmed to be affecting traffic on the contained circuits.

Accordingly, there is no determination as to whether the *same alarm* information has been generated. Harris clearly describes determinating whether "a fault can be inferred". The counter is incremented to record **the number of systems associated** with an outage, not to identify when *same alarm information* occurs more than once.

With respect to the above, the Examiner notes that Harris does not explicitly teach:

increasing a count value representing a number of times in which the same alarm information has been generated, without redundantly storing said alarm information into said

database, when it is determined that said alarm information is already stored in said database; nor

storing the increased count value at a position corresponding to said alarm information already stored in said database.

Accordingly, the Examiner applies Joyce in this regard.

Joyce is related generally to minicomputer systems and more particularly to storage hierarchies having high speed, low capacity storage devices and lower speed, high capacity storage devices coupled in common to a system bus. Joyce is not concerned with network telecommunications.

Accordingly, Joyce is **not analogous** to Harris not the present invention.

It appears, instead, that the Examiner found Harris to be lacking with respect to the foregoing features of claims 1 and 8, and based on this, *i.e.,* **hindsight**, sought out a system having a memory buffer and associated counter.

Joyce's system includes a number of counters and the Examiner refers us to one set forth in the last feature of claim 1:

a counter coupled to said encoder and to said RAM circuits to increment by one said encoder output and store an incremented count in said column address of said RAM circuits for enabling the storing of information corresponding to said replacement information in the location of said data buffer identical of that stored in main memory during said replacement operation.

Joyce's counter is, therefore, an address counter that is incremented to allow for the storage of of replacement information. This counter is not incremented on the basis of finding that current information is the same as previously stored information such that the current information is not stored. Nor is the count incremented to indicate the number of times the information was stored, as

Joyce's claim clearly describes incrementing the count to enable the storage of information corresponding to replacement information.

Accordingly, the rejection of claims 1 and 8 is deemed to be in error because Joyce does not teach the feature of *increasing a count value representing a number of times in which the same alarm information has been generated, without redundantly storing said alarm information into said database, when it is determined that said alarm information is already stored in said database*, noted as lacking in Harris.

Accordingly, the rejection of claims 1-14 is deemed to be in error and should be withdrawn.

The examiner is respectfully requested to reconsider the application, withdraw the objections and/or rejections and pass the application to issue in view of the above amendments and/or remarks.

Should a Petition for extension of time be required with the filing of this Amendment, the Commissioner is kindly requested to treat this paragraph as such a request and is authorized to charge Deposit Account No. 02-4943 of Applicant's undersigned attorney in the amount of the incurred fee if, **and only if**, a petition for extension of time be required **and** a check of the requisite amount is not enclosed.

Respectfully submitted,

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